



SEQUENCE LISTING

<110> AKIRA, SHIZUO
HEMMI, HIROAKI

<120> RECEPTOR PROTEINS SPECIFICALLY RECOGNIZING BACTERIAL
DNA

<130> 31671-178057

<140> 10/088,567

<141> 2002-03-19

<150> PCT/JP01/04731

<151> 2001-06-05

<150> JP 2000-219652

<151> 2000-07-19

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<170> PatentIn Ver. 3.3

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                               Met Gly Phe
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tgc cgc agc gcc ctg cac ccg ctg tct ctc ctg gtg cag gcc atc atg      163
Cys Arg Ser Ala Leu His Pro Leu Ser Leu Leu Val Gln Ala Ile Met
      5                      10                      15

ctg gcc atg acc ctg gcc ctg ggt acc ttg cct gcc ttc cta ccc tgt      211
Leu Ala Met Thr Leu Ala Leu Gly Thr Leu Pro Ala Phe Leu Pro Cys
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gag ctc cag ccc cac ggc ctg gtg aac tgc aac tgg ctg ttc ctg aag      259
Glu Leu Gln Pro His Gly Leu Val Asn Cys Asn Trp Leu Phe Leu Lys
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Ser Val Pro His Phe Ser Met Ala Ala Pro Arg Gly Asn Val Thr Ser
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ctt tcc ttg tcc tcc aac cgc atc cac cac ctc cat gat tct gac ttt      355
Leu Ser Leu Ser Ser Asn Arg Ile His His Leu His Asp Ser Asp Phe
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| Ala His Leu Pro Ser Leu Arg His Leu Asn Leu Lys Trp Asn Cys Pro | |
| 85 90 95 | |
| ccg gtt ggc ctc agc ccc atg cac ttc ccc tgc cac atg acc atc gag | 451 |
| Pro Val Gly Leu Ser Pro Met His Phe Pro Cys His Met Thr Ile Glu | |
| 100 105 110 115 | |
| ccc agc acc ttc ttg gct gtg ccc acc ctg gaa gag cta aac ctg agc | 499 |
| Pro Ser Thr Phe Leu Ala Val Pro Thr Leu Glu Glu Leu Asn Leu Ser | |
| 120 125 130 | |
| tac aac aac atc atg act gtg cct gcg ctg ccc aaa tcc ctc ata tcc | 547 |
| Tyr Asn Asn Ile Met Thr Val Pro Ala Leu Pro Lys Ser Leu Ile Ser | |
| 135 140 145 | |
| ctg tcc ctc agc cat acc aac atc ctg atg cta gac tct gcc agc ctc | 595 |
| Leu Ser Leu Ser His Thr Asn Ile Leu Met Leu Asp Ser Ala Ser Leu | |
| 150 155 160 | |
| gcc ggc ctg cat gcc ctg cgc ttc cta ttc atg gac ggc aac tgt tat | 643 |
| Ala Gly Leu His Ala Leu Arg Phe Leu Phe Met Asp Gly Asn Cys Tyr | |
| 165 170 175 | |
| tac aag aac ccc tgc agg cag gca ctg gag gtg gcc ccg ggt gcc ctc | 691 |
| Tyr Lys Asn Pro Cys Arg Gln Ala Leu Glu Val Ala Pro Gly Ala Leu | |
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| ctt ggc ctg ggc aac ctc acc cac ctg tca ctc aag tac aac aac ctc | 739 |
| Leu Gly Leu Gly Asn Leu Thr His Leu Ser Leu Lys Tyr Asn Asn Leu | |
| 200 205 210 | |
| act gtg gtg ccc cgc aac ctg cct tcc agc ctg gag tat ctg ctg ttg | 787 |
| Thr Val Val Pro Arg Asn Leu Pro Ser Ser Leu Glu Tyr Leu Leu Leu | |
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| tcc tac aac cgc atc gtc aaa ctg gcg cct gag gac ctg gcc aat ctg | 835 |
| Ser Tyr Asn Arg Ile Val Lys Leu Ala Pro Glu Asp Leu Ala Asn Leu | |
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| acc gcc ctg cgt gtg ctc gat gtg ggc gga aat tgc cgc cgc tgc gac | 883 |
| Thr Ala Leu Arg Val Leu Asp Val Gly Gly Asn Cys Arg Arg Cys Asp | |
| 245 250 255 | |
| cac gct ccc aac ccc tgc atg gag tgc cct cgt cac ttc ccc cag cta | 931 |
| His Ala Pro Asn Pro Cys Met Glu Cys Pro Arg His Phe Pro Gln Leu | |
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| His Pro Asp Thr Phe Ser His Leu Ser Arg Leu Glu Gly Leu Val Leu | |
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| aag gac agt tct ctc tcc tgg ctg aat gcc agt tgg ttc cgt ggg ctg | 1027 |
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| 295 300 305 | |

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| atc act aaa acc aag gcc ttc cag ggc cta aca cag ctg cgc aag ctt | 1123 |
| Ile Thr Lys Thr Lys Ala Phe Gln Gly Leu Thr Gln Leu Arg Lys Leu | |
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| ctg gcc cct tcc ttc ggg agc ctg gtc gcc ctg aag gag ctg gac atg | 1219 |
| Leu Ala Pro Ser Phe Gly Ser Leu Val Ala Leu Lys Glu Leu Asp Met | |
| 360 365 370 | |
| cac ggc atc ttc ttc cgc tca ctc gat gag acc acg ctc cgg cca ctg | 1267 |
| His Gly Ile Phe Phe Arg Ser Leu Asp Glu Thr Thr Leu Arg Pro Leu | |
| 375 380 385 | |
| gcc cgc ctg ccc atg ctc cag act ctg cgt ctg cag atg aac ttc atc | 1315 |
| Ala Arg Leu Pro Met Leu Gln Thr Leu Arg Leu Gln Met Asn Phe Ile | |
| 390 395 400 | |
| aac cag gcc cag ctc ggc atc ttc agg gcc ttc cct ggc ctg cgc tac | 1363 |
| Asn Gln Ala Gln Leu Gly Ile Phe Arg Ala Phe Pro Gly Leu Arg Tyr | |
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| gtg gac ctg tcg gac aac cgc atc agc gga gct tcg gag ctg aca gcc | 1411 |
| Val Asp Leu Ser Asp Asn Arg Ile Ser Gly Ala Ser Glu Leu Thr Ala | |
| 420 425 430 435 | |
| acc atg ggg gag gca gat gga ggg gag aag gtc tgg ctg cag cct ggg | 1459 |
| Thr Met Gly Glu Ala Asp Gly Gly Glu Lys Val Trp Leu Gln Pro Gly | |
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| gac ctt gct ccg gcc cca gtg gac act ccc agc tct gaa gac ttc agg | 1507 |
| Asp Leu Ala Pro Ala Pro Val Asp Thr Pro Ser Ser Glu Asp Phe Arg | |
| 455 460 465 | |
| ccc aac tgc agc acc ctc aac ttc acc ttg gat ctg tca cgg aac aac | 1555 |
| Pro Asn Cys Ser Thr Leu Asn Phe Thr Leu Asp Leu Ser Arg Asn Asn | |
| 470 475 480 | |
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| Leu Val Thr Val Gln Pro Glu Met Phe Ala Gln Leu Ser His Leu Gln | |
| 485 490 495 | |
| tgc ctg cgc ctg agc cac aac tgc atc tcg cag gca gtc aat ggc tcc | 1651 |
| Cys Leu Arg Leu Ser His Asn Cys Ile Ser Gln Ala Val Asn Gly Ser | |
| 500 505 510 515 | |
| cag ttc ctg ccg ctg acc ggt ctg cag gtg cta gac ctg tcc cac aat | 1699 |
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| aag ctg gac ctc tac cac gag cac tca ttc acg gag cta cca cga ctg | 1747 |
| Lys Leu Asp Leu Tyr His Glu His Ser Phe Thr Glu Leu Pro Arg Leu | |
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| gag gcc ctg gac ctc agc tac aac agc cag ccc ttt ggc atg cag ggc | 1795 |
| Glu Ala Leu Asp Leu Ser Tyr Asn Ser Gln Pro Phe Gly Met Gln Gly | |
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| gtg ggc cac aac ttc agc ttc gtg gct cac ctg cgc acc ctg cgc cac | 1843 |
| Val Gly His Asn Phe Ser Phe Val Ala His Leu Arg Thr Leu Arg His | |
| 565 570 575 | |
| ctc agc ctg gcc cac aac aac atc cac agc caa gtg tcc cag cag ctc | 1891 |
| Leu Ser Leu Ala His Asn Asn Ile His Ser Gln Val Ser Gln Gln Leu | |
| 580 585 590 595 | |
| tgc agt acg tgc ctg cgg gcc ctg gac ttc agc ggc aat gca ctg ggc | 1939 |
| Cys Ser Thr Ser Leu Arg Ala Leu Asp Phe Ser Gly Asn Ala Leu Gly | |
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| cat atg tgg gcc gag gga gac ctc tat ctg cac ttc ttc caa ggc ctg | 1987 |
| His Met Trp Ala Glu Gly Asp Leu Tyr Leu His Phe Phe Gln Gly Leu | |
| 615 620 625 | |
| agc ggt ttg atc tgg ctg gac ttg tcc cag aac cgc ctg cac acc ctc | 2035 |
| Ser Gly Leu Ile Trp Leu Asp Leu Ser Gln Asn Arg Leu His Thr Leu | |
| 630 635 640 | |
| ctg ccc caa acc ctg cgc aac ctc ccc aag agc cta cag gtg ctg cgt | 2083 |
| Leu Pro Gln Thr Leu Arg Asn Leu Pro Lys Ser Leu Gln Val Leu Arg | |
| 645 650 655 | |
| ctc cgt gac aat tac ctg gcc ttc ttt aag tgg tgg agc ctc cac ttc | 2131 |
| Leu Arg Asp Asn Tyr Leu Ala Phe Phe Lys Trp Trp Ser Leu His Phe | |
| 660 665 670 675 | |
| ctg ccc aaa ctg gaa gtc ctc gac ctg gca gga aac cag ctg aag gcc | 2179 |
| Leu Pro Lys Leu Glu Val Leu Asp Leu Ala Gly Asn Gln Leu Lys Ala | |
| 680 685 690 | |
| ctg acc aat ggc agc ctg cct gct ggc acc cgg ctc cgg agg ctg gat | 2227 |
| Leu Thr Asn Gly Ser Leu Pro Ala Gly Thr Arg Leu Arg Arg Leu Asp | |
| 695 700 705 | |
| gtc agc tgc aac agc atc agc ttc gtg gcc ccc ggc ttc ttt tcc aag | 2275 |
| Val Ser Cys Asn Ser Ile Ser Phe Val Ala Pro Gly Phe Phe Ser Lys | |
| 710 715 720 | |
| gcc aag gag ctg cga gag ctc aac ctt agc gcc aac gcc ctc aag aca | 2323 |
| Ala Lys Glu Leu Arg Glu Leu Asn Leu Ser Ala Asn Ala Leu Lys Thr | |
| 725 730 735 | |
| gtg gac cac tcc tgg ttt ggg ccc ctg gcg agt gcc ctg caa ata cta | 2371 |
| Val Asp His Ser Trp Phe Gly Pro Leu Ala Ser Ala Leu Gln Ile Leu | |
| 740 745 750 755 | |

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| gat gta agc gcc aac cct ctg cac tgc gcc tgt ggg gcg gcc ttt atg | 2419 |
| Asp Val Ser Ala Asn Pro Leu His Cys Ala Cys Gly Ala Ala Phe Met | |
| 760 765 770 | |
| gac ttc ctg ctg gag gtg cag gct gcc gtg ccc ggt ctg ccc agc cgg | 2467 |
| Asp Phe Leu Leu Glu Val Gln Ala Ala Val Pro Gly Leu Pro Ser Arg | |
| 775 780 785 | |
| gtg aag tgt ggc agt ccg ggc cag ctc cag ggc ctc agc atc ttt gca | 2515 |
| Val Lys Cys Gly Ser Pro Gly Gln Leu Gln Gly Leu Ser Ile Phe Ala | |
| 790 795 800 | |
| cag gac ctg cgc ctc tgc ctg gat gag gcc ctc tcc tgg gac tgt ttc | 2563 |
| Gln Asp Leu Arg Leu Cys Leu Asp Glu Ala Leu Ser Trp Asp Cys Phe | |
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| gcc ctc tcg ctg ctg gct gtg gct ctg ggc ctg ggt gtg ccc atg ctg | 2611 |
| Ala Leu Ser Leu Leu Ala Val Ala Leu Gly Leu Gly Val Pro Met Leu | |
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| cat cac ctc tgt ggc tgg gac ctc tgg tac tgc ttc cac ctg tgc ctg | 2659 |
| His His Leu Cys Gly Trp Asp Leu Trp Tyr Cys Phe His Leu Cys Leu | |
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| 855 860 865 | |
| ctg ccc tac gat gcc ttc gtg gtc ttc gac aaa acg cag agc gca gtg | 2755 |
| Leu Pro Tyr Asp Ala Phe Val Val Phe Asp Lys Thr Gln Ser Ala Val | |
| 870 875 880 | |
| gca gac tgg gtg tac aac gag ctt cgg ggg cag ctg gag gag tgc cgt | 2803 |
| Ala Asp Trp Val Tyr Asn Glu Leu Arg Gly Gln Leu Glu Glu Cys Arg | |
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| Gly Lys Thr Leu Phe Glu Asn Leu Trp Ala Ser Val Tyr Gly Ser Arg | |
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| aag acg ctg ttt gtg ctg gcc cac acg gac cgg gtc agt ggt ctc ttg | 2947 |
| Lys Thr Leu Phe Val Leu Ala His Thr Asp Arg Val Ser Gly Leu Leu | |
| 935 940 945 | |
| cgc gcc agc ttc ctg ctg gcc cag cag cgc ctg ctg gag gac cgc aag | 2995 |
| Arg Ala Ser Phe Leu Leu Ala Gln Gln Arg Leu Leu Glu Asp Arg Lys | |
| 950 955 960 | |
| gac gtc gtg gtg ctg gtg atc ctg agc cct gac ggc cgc cgc tcc cgc | 3043 |
| Asp Val Val Val Leu Val Ile Leu Ser Pro Asp Gly Arg Arg Ser Arg | |
| 965 970 975 | |

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 Tyr Val Arg Leu Arg Gln Arg Leu Cys Arg Gln Ser Val Leu Leu Trp
 980 985 990 995

ccc cac cag ccc agt ggt cag cgc agc ttc tgg gcc cag ctg ggc atg 3139
 Pro His Gln Pro Ser Gly Gln Arg Ser Phe Trp Ala Gln Leu Gly Met
 1000 1005 1010

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Phe Leu Lys Ser Val Pro His Phe Ser Met Ala Ala Pro Arg Gly Asn
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Val Thr Ser Leu Ser Leu Ser Ser Asn Arg Ile His His Leu His Asp
 65 70 75 80

Ser Asp Phe Ala His Leu Pro Ser Leu Arg His Leu Asn Leu Lys Trp
 85 90 95

Asn Cys Pro Pro Val Gly Leu Ser Pro Met His Phe Pro Cys His Met
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Thr Ile Glu Pro Ser Thr Phe Leu Ala Val Pro Thr Leu Glu Glu Leu
 115 120 125

Asn Leu Ser Tyr Asn Asn Ile Met Thr Val Pro Ala Leu Pro Lys Ser
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Leu Ile Ser Leu Ser Leu Ser His Thr Asn Ile Leu Met Leu Asp Ser
 145 150 155 160

Ala Ser Leu Ala Gly Leu His Ala Leu Arg Phe Leu Phe Met Asp Gly
 165 170 175

| | | | | | | | | | | | | | | | | | |
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| Asn | Cys | Tyr | Tyr | Lys | Asn | Pro | Cys | Arg | Gln | Ala | Leu | Glu | Val | Ala | Pro | | |
| | | | 180 | | | | | | 185 | | | | 190 | | | | |
| Gly | Ala | Leu | Leu | Gly | Leu | Gly | Asn | Leu | Thr | His | Leu | Ser | Leu | Lys | Tyr | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Asn | Asn | Leu | Thr | Val | Val | Pro | Arg | Asn | Leu | Pro | Ser | Ser | Leu | Glu | Tyr | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Leu | Leu | Leu | Ser | Tyr | Asn | Arg | Ile | Val | Lys | Leu | Ala | Pro | Glu | Asp | Leu | | |
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| Ala | Asn | Leu | Thr | Ala | Leu | Arg | Val | Leu | Asp | Val | Gly | Gly | Asn | Cys | Arg | | |
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| Arg | Cys | Asp | His | Ala | Pro | Asn | Pro | Cys | Met | Glu | Cys | Pro | Arg | His | Phe | | |
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| Pro | Gln | Leu | His | Pro | Asp | Thr | Phe | Ser | His | Leu | Ser | Arg | Leu | Glu | Gly | | |
| | | 275 | | | | | 280 | | | | | 285 | | | | | |
| Leu | Val | Leu | Lys | Asp | Ser | Ser | Leu | Ser | Trp | Leu | Asn | Ala | Ser | Trp | Phe | | |
| | 290 | | | | | 295 | | | | | 300 | | | | | | |
| Arg | Gly | Leu | Gly | Asn | Leu | Arg | Val | Leu | Asp | Leu | Ser | Glu | Asn | Phe | Leu | | |
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| Tyr | Lys | Cys | Ile | Thr | Lys | Thr | Lys | Ala | Phe | Gln | Gly | Leu | Thr | Gln | Leu | | |
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| Arg | Lys | Leu | Asn | Leu | Ser | Phe | Asn | Tyr | Gln | Lys | Arg | Val | Ser | Phe | Ala | | |
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| His | Leu | Ser | Leu | Ala | Pro | Ser | Phe | Gly | Ser | Leu | Val | Ala | Leu | Lys | Glu | | |
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| Leu | Asp | Met | His | Gly | Ile | Phe | Phe | Arg | Ser | Leu | Asp | Glu | Thr | Thr | Leu | | |
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| | | | | 405 | | | | | 410 | | | | | 415 | | | |
| Leu | Arg | Tyr | Val | Asp | Leu | Ser | Asp | Asn | Arg | Ile | Ser | Gly | Ala | Ser | Glu | | |
| | | | 420 | | | | | 425 | | | | | 430 | | | | |
| Leu | Thr | Ala | Thr | Met | Gly | Glu | Ala | Asp | Gly | Gly | Glu | Lys | Val | Trp | Leu | | |
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| Gln | Pro | Gly | Asp | Leu | Ala | Pro | Ala | Pro | Val | Asp | Thr | Pro | Ser | Ser | Glu | | |
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Pro Ser Arg Val Lys Cys Gly Ser Pro Gly Gln Leu Gln Gly Leu Ser
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 850 855 860
 Glu Asp Ala Leu Pro Tyr Asp Ala Phe Val Val Phe Asp Lys Thr Gln
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 Asp Arg Lys Asp Val Val Val Leu Val Ile Leu Ser Pro Asp Gly Arg
 965 970 975
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 980 985 990
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                                   Met Val Leu
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cgt cga agg act ctg cac ccc ttg tcc ctc ctg gta cag gct gca gtg 163
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Leu Ala Glu Thr Leu Ala Leu Gly Thr Leu Pro Ala Phe Leu Pro Cys
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Glu Leu Lys Pro His Gly Leu Val Asp Cys Asn Trp Leu Phe Leu Lys
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Ser Val Pro Arg Phe Ser Ala Ala Ala Ser Cys Ser Asn Ile Thr Arg
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Leu Ser Leu Ile Ser Asn Arg Ile His His Leu His Asn Ser Asp Phe
      70                                75                                80

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Val His Leu Ser Asn Leu Arg Gln Leu Asn Leu Lys Trp Asn Cys Pro
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ccc act ggc ctt agc ccc ttg cac ttc tct tgc cac atg acc att gag 451
Pro Thr Gly Leu Ser Pro Leu His Phe Ser Cys His Met Thr Ile Glu
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ccc aga acc ttc ctg gct atg cgt aca ctg gag gag ctg aac ctg agc 499
Pro Arg Thr Phe Leu Ala Met Arg Thr Leu Glu Glu Leu Asn Leu Ser
                                120                                125                                130

tat aat ggt atc acc act gtg ccc cga ctg ccc agc tcc ctg gtg aat 547
Tyr Asn Gly Ile Thr Thr Val Pro Arg Leu Pro Ser Ser Leu Val Asn
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ctg agc ctg agc cac acc aac atc ctg gtt cta gat gct aac agc ctc 595
Leu Ser Leu Ser His Thr Asn Ile Leu Val Leu Asp Ala Asn Ser Leu
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Ala Gly Leu Tyr Ser Leu Arg Val Leu Phe Met Asp Gly Asn Cys Tyr
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tac aag aac ccc tgc aca gga gcg gtg aag gtg acc cca ggc gcc ctc 691
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| | |
|--|------|
| ctg ggc ctg agc aat ctc acc cat ctg tct gtg aag tat aac aac ctc Leu Gly Leu Ser Asn Leu Thr His Leu Ser Val Lys Tyr Asn Asn Leu | 739 |
| 200 205 210 | |
| aca aag gtg ccc cgc caa ctg ccc ccc agc ctg gag tac ctc ctg gtg Thr Lys Val Pro Arg Gln Leu Pro Pro Ser Leu Glu Tyr Leu Leu Val | 787 |
| 215 220 225 | |
| tcc tat aac ctc att gtc aag ctg ggg cct gaa gac ctg gcc aat ctg Ser Tyr Asn Leu Ile Val Lys Leu Gly Pro Glu Asp Leu Ala Asn Leu | 835 |
| 230 235 240 | |
| acc tcc ctt cga gta ctt gat gtg ggt ggg aat tgc cgt cgc tgc gac Thr Ser Leu Arg Val Leu Asp Val Gly Gly Asn Cys Arg Arg Cys Asp | 883 |
| 245 250 255 | |
| cat gcc ccc aat ccc tgt ata gaa tgt ggc caa aag tcc ctc cac ctg His Ala Pro Asn Pro Cys Ile Glu Cys Gly Gln Lys Ser Leu His Leu | 931 |
| 260 265 270 275 | |
| cac cct gag acc ttc cat cac ctg agc cat ctg gaa ggc ctg gtg ctg His Pro Glu Thr Phe His His Leu Ser His Leu Glu Gly Leu Val Leu | 979 |
| 280 285 290 | |
| aag gac agc tct ctc cat aca ctg aac tct tcc tgg ttc caa ggt ctg Lys Asp Ser Ser Leu His Thr Leu Asn Ser Ser Trp Phe Gln Gly Leu | 1027 |
| 295 300 305 | |
| gtc aac ctc tgc gtg ctg gac cta agc gag aac ttt ctc tat gaa agc Val Asn Leu Ser Val Leu Asp Leu Ser Glu Asn Phe Leu Tyr Glu Ser | 1075 |
| 310 315 320 | |
| atc aac cac acc aat gcc ttt cag aac cta acc cgc ctg cgc aag ctc Ile Asn His Thr Asn Ala Phe Gln Asn Leu Thr Arg Leu Arg Lys Leu | 1123 |
| 325 330 335 | |
| aac ctg tcc ttc aat tac cgc aag aag gta tcc ttt gcc cgc ctc cac Asn Leu Ser Phe Asn Tyr Arg Lys Lys Val Ser Phe Ala Arg Leu His | 1171 |
| 340 345 350 355 | |
| ctg gca agt tcc ttc aag aac ctg gtg tca ctg cag gag ctg aac atg Leu Ala Ser Ser Phe Lys Asn Leu Val Ser Leu Gln Glu Leu Asn Met | 1219 |
| 360 365 370 | |
| aac ggc atc ttc ttc cgc tgc ctc aac aag tac acg ctc aga tgg ctg Asn Gly Ile Phe Phe Arg Ser Leu Asn Lys Tyr Thr Leu Arg Trp Leu | 1267 |
| 375 380 385 | |
| gcc gat ctg ccc aaa ctc cac act ctg cat ctt caa atg aac ttc atc Ala Asp Leu Pro Lys Leu His Thr Leu His Leu Gln Met Asn Phe Ile | 1315 |
| 390 395 400 | |
| aac cag gca cag ctc agc atc ttt ggt acc ttc cga gcc ctt cgc ttt Asn Gln Ala Gln Leu Ser Ile Phe Gly Thr Phe Arg Ala Leu Arg Phe | 1363 |
| 405 410 415 | |

| | |
|---|------|
| gtg gac ttg tca gac aat cgc atc agt ggg cct tca acg ctg tca gaa | 1411 |
| Val Asp Leu Ser Asp Asn Arg Ile Ser Gly Pro Ser Thr Leu Ser Glu | |
| 420 425 430 435 | |
| gcc acc cct gaa gag gca gat gat gca gag cag gag gag ctg ttg tct | 1459 |
| Ala Thr Pro Glu Glu Ala Asp Asp Ala Glu Gln Glu Glu Leu Leu Ser | |
| 440 445 450 | |
| gcg gat cct cac cca gct cca ctg agc acc cct gct tct aag aac ttc | 1507 |
| Ala Asp Pro His Pro Ala Pro Leu Ser Thr Pro Ala Ser Lys Asn Phe | |
| 455 460 465 | |
| atg gac agg tgt aag aac ttc aag ttc acc atg gac ctg tct cgg aac | 1555 |
| Met Asp Arg Cys Lys Asn Phe Lys Phe Thr Met Asp Leu Ser Arg Asn | |
| 470 475 480 | |
| aac ctg gtg act atc aag cca gag atg ttt gtc aat ctc tca cgc ctc | 1603 |
| Asn Leu Val Thr Ile Lys Pro Glu Met Phe Val Asn Leu Ser Arg Leu | |
| 485 490 495 | |
| cag tgt ctt agc ctg agc cac aac tcc att gca cag gct gtc aat ggc | 1651 |
| Gln Cys Leu Ser Leu Ser His Asn Ser Ile Ala Gln Ala Val Asn Gly | |
| 500 505 510 515 | |
| tct cag ttc ctg ccg ctg act aat ctg cag gtg ctg gac ctg tcc cat | 1699 |
| Ser Gln Phe Leu Pro Leu Thr Asn Leu Gln Val Leu Asp Leu Ser His | |
| 520 525 530 | |
| aac aaa ctg gac ttg tac cac tgg aaa tcg ttc agt gag cta cca cag | 1747 |
| Asn Lys Leu Asp Leu Tyr His Trp Lys Ser Phe Ser Glu Leu Pro Gln | |
| 535 540 545 | |
| ttg cag gcc ctg gac ctg agc tac aac agc cag ccc ttt agc atg aag | 1795 |
| Leu Gln Ala Leu Asp Leu Ser Tyr Asn Ser Gln Pro Phe Ser Met Lys | |
| 550 555 560 | |
| ggg ata ggc cac aat ttc agt ttt gtg gcc cat ctg tcc atg cta cac | 1843 |
| Gly Ile Gly His Asn Phe Ser Phe Val Ala His Leu Ser Met Leu His | |
| 565 570 575 | |
| agc ctt agc ctg gca cac aat gac att cat acc cgt gtg tcc tca cat | 1891 |
| Ser Leu Ser Leu Ala His Asn Asp Ile His Thr Arg Val Ser Ser His | |
| 580 585 590 595 | |
| ctc aac agc aac tca gtg agg ttt ctt gac ttc agc ggc aac ggt atg | 1939 |
| Leu Asn Ser Asn Ser Val Arg Phe Leu Asp Phe Ser Gly Asn Gly Met | |
| 600 605 610 | |
| ggc cgc atg tgg gat gag ggg ggc ctt tat ctc cat ttc ttc caa ggc | 1987 |
| Gly Arg Met Trp Asp Glu Gly Gly Leu Tyr Leu His Phe Phe Gln Gly | |
| 615 620 625 | |
| ctg agt ggc ctg ctg aag ctg gac ctg tct caa aat aac ctg cat atc | 2035 |
| Leu Ser Gly Leu Leu Lys Leu Asp Leu Ser Gln Asn Asn Leu His Ile | |
| 630 635 640 | |

| | |
|---|------|
| ctc cgg ccc cag aac ctt gac aac ctc ccc aag agc ctg aag ctg ctg Leu Arg Pro Gln Asn Leu Asp Asn Leu Pro Lys Ser Leu Lys Leu Leu 645 650 655 | 2083 |
| agc ctc cga gac aac tac cta tct ttc ttt aac tgg acc agt ctg tcc Ser Leu Arg Asp Asn Tyr Leu Ser Phe Phe Asn Trp Thr Ser Leu Ser 660 665 670 675 | 2131 |
| ttc ctg ccc aac ctg gaa gtc cta gac ctg gca ggc aac cag cta aag Phe Leu Pro Asn Leu Glu Val Leu Asp Leu Ala Gly Asn Gln Leu Lys 680 685 690 | 2179 |
| gcc ctg acc aat ggc acc ctg cct aat ggc acc ctc ctc cag aaa ctg Ala Leu Thr Asn Gly Thr Leu Pro Asn Gly Thr Leu Leu Gln Lys Leu 695 700 705 | 2227 |
| gat gtc agc agc aac agt atc gtc tct gtg gtc cca gcc ttc ttc gct Asp Val Ser Ser Asn Ser Ile Val Ser Val Val Pro Ala Phe Phe Ala 710 715 720 | 2275 |
| ctg gcg gtc gag ctg aaa gag gtc aac ctc agc cac aac att ctc aag Leu Ala Val Glu Leu Lys Glu Val Asn Leu Ser His Asn Ile Leu Lys 725 730 735 | 2323 |
| acg gtg gat cgc tcc tgg ttt ggg ccc att gtg atg aac ctg aca gtt Thr Val Asp Arg Ser Trp Phe Gly Pro Ile Val Met Asn Leu Thr Val 740 745 750 755 | 2371 |
| cta gac gtg aga agc aac cct ctg cac tgt gcc tgt ggg gca gcc ttc Leu Asp Val Arg Ser Asn Pro Leu His Cys Ala Cys Gly Ala Ala Phe 760 765 770 | 2419 |
| gta gac tta ctg ttg gag gtg cag acc aag gtg cct ggc ctg gct aat Val Asp Leu Leu Leu Glu Val Gln Thr Lys Val Pro Gly Leu Ala Asn 775 780 785 | 2467 |
| ggc gtg aag tgt ggc agc ccc ggc cag ctg cag ggc cgt agc atc ttc Gly Val Lys Cys Gly Ser Pro Gly Gln Leu Gln Gly Arg Ser Ile Phe 790 795 800 | 2515 |
| gca cag gac ctg cgg ctg tgc ctg gat gag gtc ctc tct tgg gac tgc Ala Gln Asp Leu Arg Leu Cys Leu Asp Glu Val Leu Ser Trp Asp Cys 805 810 815 | 2563 |
| ttt ggc ctt tca ctc ttg gct gtg gcc gtg ggc atg gtg gtg cct ata Phe Gly Leu Ser Leu Leu Ala Val Ala Val Gly Met Val Val Pro Ile 820 825 830 835 | 2611 |
| ctg cac cat ctc tgc ggc tgg gac gtc tgg tac tgt ttt cat ctg tgc Leu His His Leu Cys Gly Trp Asp Val Trp Tyr Cys Phe His Leu Cys 840 845 850 | 2659 |
| ctg gca tgg cta cct ttg ctg gcc cgc agc cga cgc agc gcc caa gct Leu Ala Trp Leu Pro Leu Leu Ala Arg Ser Arg Arg Ser Ala Gln Ala 855 860 865 | 2707 |

ctc ccc tat gat gcc ttc gtg gtg ttc gat aag gca cag agc gca gtt 2755
 Leu Pro Tyr Asp Ala Phe Val Val Phe Asp Lys Ala Gln Ser Ala Val
 870 875 880

gcg gac tgg gtg tat aac gag ctg cgg gtg cgg ctg gag gag cgg cgc 2803
 Ala Asp Trp Val Tyr Asn Glu Leu Arg Val Arg Leu Glu Glu Arg Arg
 885 890 895

ggt cgc cga gcc cta cgc ttg tgt ctg gag gac cga gat tgg ctg cct 2851
 Gly Arg Arg Ala Leu Arg Leu Cys Leu Glu Asp Arg Asp Trp Leu Pro
 900 905 910 915

ggc cag acg ctc ttc gag aac ctc tgg gct tcc atc tat ggg agc cgc 2899
 Gly Gln Thr Leu Phe Glu Asn Leu Trp Ala Ser Ile Tyr Gly Ser Arg
 920 925 930

aag act cta ttt gtg ctg gcc cac acg gac cgc gtc agt ggc ctc ctg 2947
 Lys Thr Leu Phe Val Leu Ala His Thr Asp Arg Val Ser Gly Leu Leu
 935 940 945

cgc acc agc ttc ctg ctg gct cag cag cgc ctg ttg gaa gac cgc aag 2995
 Arg Thr Ser Phe Leu Leu Ala Gln Gln Arg Leu Leu Glu Asp Arg Lys
 950 955 960

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 Asp Val Val Val Leu Val Ile Leu Arg Pro Asp Ala His Arg Ser Arg
 965 970 975

tat gtg cga ctg cgc cag cgt ctc tgc cgc cag agt gtg ctc ttc tgg 3091
 Tyr Val Arg Leu Arg Gln Arg Leu Cys Arg Gln Ser Val Leu Phe Trp
 980 985 990 995

ccc cag cag ccc aac ggg cag ggg ggc ttc tgg gcc cag ctg agt aca 3139
 Pro Gln Gln Pro Asn Gly Gln Gly Gly Phe Trp Ala Gln Leu Ser Thr
 1000 1005 1010

gcc ctg act agg gac aac cgc cac ttc tat aac cag aac ttc tgc cgg 3187
 Ala Leu Thr Arg Asp Asn Arg His Phe Tyr Asn Gln Asn Phe Cys Arg
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gga cct aca gca gaa tag ctccagagcaa cagctggaaa cagctgcac 3235
 Gly Pro Thr Ala Glu
 1030

ttcatgcctg gttcccgagt tgctctgcct gccttgctct gtcttactac accgctat 3295

ggcaagtgcg caatatatgc taccaagcca ccaggccac ggagcaaagg ttggcagtaa 3355

agggtagttt tcttcccatg catctttcag gagagtgaag atagacacca gaccacaca 3415

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<210> 4

<211> 1032

<212> PRT

<213> Mus musculus

<400> 4

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Val | Leu | Arg | Arg | Arg | Thr | Leu | His | Pro | Leu | Ser | Leu | Leu | Val | Gln |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Ala | Ala | Val | Leu | Ala | Glu | Thr | Leu | Ala | Leu | Gly | Thr | Leu | Pro | Ala | Phe |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Leu | Pro | Cys | Glu | Leu | Lys | Pro | His | Gly | Leu | Val | Asp | Cys | Asn | Trp | Leu |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Phe | Leu | Lys | Ser | Val | Pro | Arg | Phe | Ser | Ala | Ala | Ala | Ser | Cys | Ser | Asn |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Ile | Thr | Arg | Leu | Ser | Leu | Ile | Ser | Asn | Arg | Ile | His | His | Leu | His | Asn |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Ser | Asp | Phe | Val | His | Leu | Ser | Asn | Leu | Arg | Gln | Leu | Asn | Leu | Lys | Trp |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Asn | Cys | Pro | Pro | Thr | Gly | Leu | Ser | Pro | Leu | His | Phe | Ser | Cys | His | Met |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Thr | Ile | Glu | Pro | Arg | Thr | Phe | Leu | Ala | Met | Arg | Thr | Leu | Glu | Glu | Leu |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Asn | Leu | Ser | Tyr | Asn | Gly | Ile | Thr | Thr | Val | Pro | Arg | Leu | Pro | Ser | Ser |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Leu | Val | Asn | Leu | Ser | Leu | Ser | His | Thr | Asn | Ile | Leu | Val | Leu | Asp | Ala |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Asn | Ser | Leu | Ala | Gly | Leu | Tyr | Ser | Leu | Arg | Val | Leu | Phe | Met | Asp | Gly |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Asn | Cys | Tyr | Tyr | Lys | Asn | Pro | Cys | Thr | Gly | Ala | Val | Lys | Val | Thr | Pro |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Gly | Ala | Leu | Leu | Gly | Leu | Ser | Asn | Leu | Thr | His | Leu | Ser | Val | Lys | Tyr |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Asn | Asn | Leu | Thr | Lys | Val | Pro | Arg | Gln | Leu | Pro | Pro | Ser | Leu | Glu | Tyr |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Leu | Leu | Val | Ser | Tyr | Asn | Leu | Ile | Val | Lys | Leu | Gly | Pro | Glu | Asp | Leu |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Ala | Asn | Leu | Thr | Ser | Leu | Arg | Val | Leu | Asp | Val | Gly | Gly | Asn | Cys | Arg |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Arg | Cys | Asp | His | Ala | Pro | Asn | Pro | Cys | Ile | Glu | Cys | Gly | Gln | Lys | Ser |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Leu | His | Leu | His | Pro | Glu | Thr | Phe | His | His | Leu | Ser | His | Leu | Glu | Gly |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Leu | Val | Leu | Lys | Asp | Ser | Ser | Leu | His | Thr | Leu | Asn | Ser | Ser | Trp | Phe |
| | 290 | | | | | | 295 | | | | 300 | | | | |

Gln Gly Leu Val Asn Leu Ser Val Leu Asp Leu Ser Glu Asn Phe Leu
 305 310 315 320
 Tyr Glu Ser Ile Asn His Thr Asn Ala Phe Gln Asn Leu Thr Arg Leu
 325 330 335
 Arg Lys Leu Asn Leu Ser Phe Asn Tyr Arg Lys Lys Val Ser Phe Ala
 340 345 350
 Arg Leu His Leu Ala Ser Ser Phe Lys Asn Leu Val Ser Leu Gln Glu
 355 360 365
 Leu Asn Met Asn Gly Ile Phe Phe Arg Ser Leu Asn Lys Tyr Thr Leu
 370 375 380
 Arg Trp Leu Ala Asp Leu Pro Lys Leu His Thr Leu His Leu Gln Met
 385 390 395 400
 Asn Phe Ile Asn Gln Ala Gln Leu Ser Ile Phe Gly Thr Phe Arg Ala
 405 410 415
 Leu Arg Phe Val Asp Leu Ser Asp Asn Arg Ile Ser Gly Pro Ser Thr
 420 425 430
 Leu Ser Glu Ala Thr Pro Glu Glu Ala Asp Asp Ala Glu Gln Glu Glu
 435 440 445
 Leu Leu Ser Ala Asp Pro His Pro Ala Pro Leu Ser Thr Pro Ala Ser
 450 455 460
 Lys Asn Phe Met Asp Arg Cys Lys Asn Phe Lys Phe Thr Met Asp Leu
 465 470 475 480
 Ser Arg Asn Asn Leu Val Thr Ile Lys Pro Glu Met Phe Val Asn Leu
 485 490 495
 Ser Arg Leu Gln Cys Leu Ser Leu Ser His Asn Ser Ile Ala Gln Ala
 500 505 510
 Val Asn Gly Ser Gln Phe Leu Pro Leu Thr Asn Leu Gln Val Leu Asp
 515 520 525
 Leu Ser His Asn Lys Leu Asp Leu Tyr His Trp Lys Ser Phe Ser Glu
 530 535 540
 Leu Pro Gln Leu Gln Ala Leu Asp Leu Ser Tyr Asn Ser Gln Pro Phe
 545 550 555 560
 Ser Met Lys Gly Ile Gly His Asn Phe Ser Phe Val Ala His Leu Ser
 565 570 575
 Met Leu His Ser Leu Ser Leu Ala His Asn Asp Ile His Thr Arg Val
 580 585 590
 Ser Ser His Leu Asn Ser Asn Ser Val Arg Phe Leu Asp Phe Ser Gly
 595 600 605

| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Gly | Met | Gly | Arg | Met | Trp | Asp | Glu | Gly | Gly | Leu | Tyr | Leu | His | Phe | 610 | 615 | 620 |
| Phe | Gln | Gly | Leu | Ser | Gly | Leu | Leu | Lys | Leu | Asp | Leu | Ser | Gln | Asn | Asn | 625 | 630 | 635 |
| Leu | His | Ile | Leu | Arg | Pro | Gln | Asn | Leu | Asp | Asn | Leu | Pro | Lys | Ser | Leu | 645 | 650 | 655 |
| Lys | Leu | Leu | Ser | Leu | Arg | Asp | Asn | Tyr | Leu | Ser | Phe | Phe | Asn | Trp | Thr | 660 | 665 | 670 |
| Ser | Leu | Ser | Phe | Leu | Pro | Asn | Leu | Glu | Val | Leu | Asp | Leu | Ala | Gly | Asn | 675 | 680 | 685 |
| Gln | Leu | Lys | Ala | Leu | Thr | Asn | Gly | Thr | Leu | Pro | Asn | Gly | Thr | Leu | Leu | 690 | 695 | 700 |
| Gln | Lys | Leu | Asp | Val | Ser | Ser | Asn | Ser | Ile | Val | Ser | Val | Val | Pro | Ala | 705 | 710 | 715 |
| Phe | Phe | Ala | Leu | Ala | Val | Glu | Leu | Lys | Glu | Val | Asn | Leu | Ser | His | Asn | 725 | 730 | 735 |
| Ile | Leu | Lys | Thr | Val | Asp | Arg | Ser | Trp | Phe | Gly | Pro | Ile | Val | Met | Asn | 740 | 745 | 750 |
| Leu | Thr | Val | Leu | Asp | Val | Arg | Ser | Asn | Pro | Leu | His | Cys | Ala | Cys | Gly | 755 | 760 | 765 |
| Ala | Ala | Phe | Val | Asp | Leu | Leu | Leu | Glu | Val | Gln | Thr | Lys | Val | Pro | Gly | 770 | 775 | 780 |
| Leu | Ala | Asn | Gly | Val | Lys | Cys | Gly | Ser | Pro | Gly | Gln | Leu | Gln | Gly | Arg | 785 | 790 | 795 |
| Ser | Ile | Phe | Ala | Gln | Asp | Leu | Arg | Leu | Cys | Leu | Asp | Glu | Val | Leu | Ser | 805 | 810 | 815 |
| Trp | Asp | Cys | Phe | Gly | Leu | Ser | Leu | Leu | Ala | Val | Ala | Val | Gly | Met | Val | 820 | 825 | 830 |
| Val | Pro | Ile | Leu | His | His | Leu | Cys | Gly | Trp | Asp | Val | Trp | Tyr | Cys | Phe | 835 | 840 | 845 |
| His | Leu | Cys | Leu | Ala | Trp | Leu | Pro | Leu | Leu | Ala | Arg | Ser | Arg | Arg | Ser | 850 | 855 | 860 |
| Ala | Gln | Ala | Leu | Pro | Tyr | Asp | Ala | Phe | Val | Val | Phe | Asp | Lys | Ala | Gln | 865 | 870 | 875 |
| Ser | Ala | Val | Ala | Asp | Trp | Val | Tyr | Asn | Glu | Leu | Arg | Val | Arg | Leu | Glu | 885 | 890 | 895 |
| Glu | Arg | Arg | Gly | Arg | Arg | Ala | Leu | Arg | Leu | Cys | Leu | Glu | Asp | Arg | Asp | 900 | 905 | 910 |

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<211> 20
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: Synthetic
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<210> 6
<211> 144
<212> DNA
<213> Mus musculus
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```

<220>
<221> CDS
<222> (1) .. (144)

```

| | | | | | | | | | | | | | | | | | |
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| tcc | aac | ctg | cgg | cag | ctg | aac | ctc | aag | tgg | aac | tgt | cca | ccc | act | ggc | 48 | |
| Ser | Asn | Leu | Arg | Gln | Leu | Asn | Leu | Lys | Trp | Asn | Cys | Pro | Pro | Thr | Gly | | |
| | 1 | | | 5 | | | | | 10 | | | | | 15 | | | |
| | | | | | | | | | | | | | | | | | |
| ctt | agc | ccc | ttg | cac | ttc | tct | tgc | cac | atg | acc | att | gag | ccc | aga | acc | 96 | |
| Leu | Ser | Pro | Leu | His | Phe | Ser | Cys | His | Met | Thr | Ile | Glu | Pro | Arg | Thr | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |

```

<400> 7
Ser Asn Leu Arg Gln Leu Asn Leu Lys Trp Asn Cys Pro Pro Thr Gly
  1                      5                      10                      15

Leu Ser Pro Leu His Phe Ser Cys His Met Thr Ile Glu Pro Arg Thr
                20                      25                      30

Phe Leu Ala Met Arg Thr Leu Glu Glu Leu Asn Leu Ser Tyr Asn Gly
      35                      40                      45

```

```
<220>  
<221> CDS  
<222> (1)..(141)
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| | | | | | | | | | | | | | | | | |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <400> 8 | | | | | | | | | | | | | | | | |
| tcc | aac | ctg | cgg | cag | ctg | aac | ctc | aag | tgg | att | ttg | tcc | acc | tgt | cct | 48 |
| Ser | Asn | Leu | Arg | Gln | Leu | Asn | Leu | Lys | Trp | Ile | Leu | Ser | Thr | Cys | Pro | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| | | | | | | | | | | | | | | | | |
| cga | cgg | atc | cga | aca | aac | gac | cca | aca | ccc | gtg | cgt | ttt | att | ctg | tct | 96 |
| Arg | Arg | Ile | Arg | Thr | Asn | Asp | Pro | Thr | Pro | Val | Arg | Phe | Ile | Leu | Ser | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| | | | | | | | | | | | | | | | | |
| ttt | tat | tgc | cga | tcc | cct | cag | aag | aac | tcg | tca | aga | agg | cga | tag | | 141 |
| Phe | Tyr | Cys | Arg | Ser | Pro | Gln | Lys | Asn | Ser | Ser | Arg | Arg | Arg | | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |

```

<400> 9
Ser Asn Leu Arg Gln Leu Asn Leu Lys Trp Ile Leu Ser Thr Cys Pro
  1                               10                      15
Arg Arg Ile Arg Thr Asn Asp Pro Thr Pro Val Arg Phe Ile Leu Ser
  20                      25                      30
Phe Tyr Cys Arg Ser Pro Gln Lys Asn Ser Ser Arg Arg Arg
  35                      40                      45

```